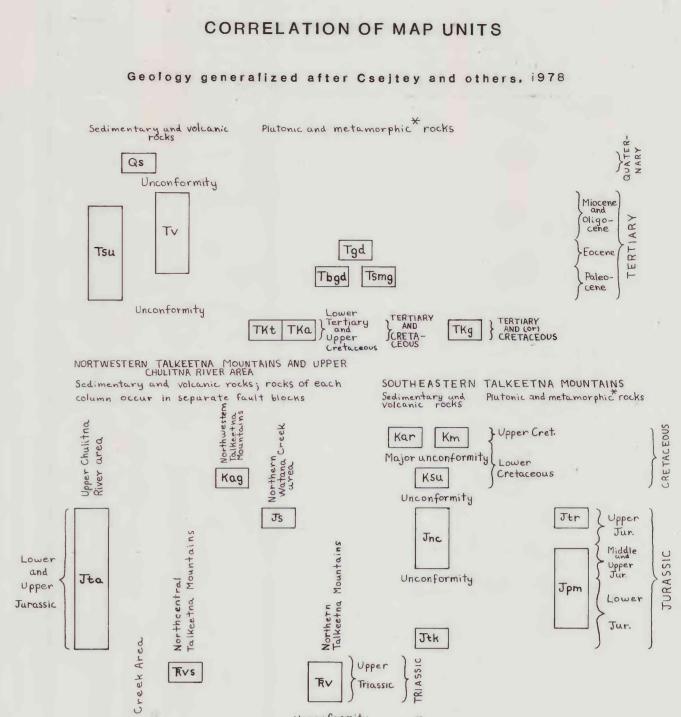
78-558P

Geochemistry-Arsenic(As)

Folio of the TALKEETNA MOUNTAINS Quadrangle, Alaska



DESCRIPTION OF MAP UNITS

- Qs SURFICIAL DEPOSITS, UNDIFFERENTIATED (Quaternary).
- Tv VOLCANIC ROCKS, UNDIVIDED (Paleocene to Pleistocene(?))--Felsic and mafic subaerial volcanic rocks and related shallow intru-
- Tsu TERTIARY SEDIMENTARY ROCKS, UNDIFFERENTIATED (Paleocene to Miocene)--Terrestrial, mostly fluviatile strata with a few lignite interbeds.

DSga | Middle | Devonian | Silurian(?) | Silurian(?)

- Tbgd BIOTITE AND HORNBLENDE GRANODIORITE (Paleocene, in part early
- Tsmg SCHIST, MIGMATITE, AND GRANITE (Paleocene intrusive and metamorphic ages)--Migmatitic border zone of biotite and hornblende
- TKt TONALITE (Upper Cretaceous and lower Paleocene).
- TKa ADAMELLITE (Upper Cretaceous and lower Paleocene). TKg GRANITIC ROCKS, UNDIVIDED (Cretaceous and (or) Tertiary).
- Kar ARKOSE RIDGE FORMATION (Lower and (or) Upper Cretaceous).
- Ksu SEDIMENTARY ROCKS, UNDIVIDED (Lower Cretaceous)--Shallow marine sequence of calcareous sandstone, claystone, and massive clastic
- Kag ARGILLITE AND LITHIC GRAYWACKE (Lower Cretaceous) -- Intercalated,
- Js SEDIMENTARY AND VOLCANIC ROCKS, UNDIVIDED (Upper Jurassic)--Marine sequence of argillite, graywacke, conglomerate, and andesitic to latitic feldspar porphyry dikes and intercalated

Jtr TRONDHJEMITE (Upper Jurassic)

calated sequence.

* Metamorphic ages

- Jnc JURASSIC SEDIMENTARY ROCKS, UNDIVIDED (Middle and Upper Jurassic)
- -- Includes Naknek and Chinitna Formations, and Tuxedni Group. Jta CRYSTAL TUFF, ARGILLITE, CHERT, GRAYWACKE, AND LIMESTONE (Lower to Upper Jurassic) -- Shallow to moderately deep marine, inter-
- Jpm PLUTONIC AND METAMORPHIC ROCKS, UNDIFFERENTIATED (Lower to Upper Jurassic) -- Mainly quartz diorite, granodiorite, amphibolite, and greenschist.
- Jtk TALKEETNA FORMATION (Lower Jurassic).
- TRVS METABASALT AND SLATE (Upper Triassic)--Intercalated, shallowwater marine sequence.
- TRV BASALTIC METAVOLCANIC ROCKS (Upper Triassic) -- Mainly shallow water marine metabasalt flows.
- Pzv BASALTIC AND ANDESITIC METAVOLCANOGENIC ROCKS (Pennsylvanian(?) and Early Permian) -- Metamorphosed marine sequence of interlayered basaltic to andesitic flows, tuffs, coarse volcaniclastic rocks, and subordinate mudstone and limestone.
- DSga GRAYWACKE, ARGILLITE, SHALE, AND LIMESTONE (Silurian(?) to Middle Devonian)--Intercalated marine sequence, probably continental margin deposits.

EXPLANATION OF GEOLOGIC MAP SYMBOLS

Contact, approximately located ______ Approximate contact of surficial deposits

postulated thrust

Long dashed where approximately located; short dashed where inferred; dotted where concealed. U indicates upthrown side where direction of displacement is known. Arrows indicate relative lateral movement Thrust fault

Long dashed where approximately located, dotted where concealed. Teeth indicate upthrown side.

Approximate axis of intense shear zone of variable width, possibly marking a thrust fault Dotted where concealed; teeth indicate possible upthrown side of

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Tgd GRANODIORITE (Eocene). granodiorite. Km MATANUSKA FORMATION (Lower and Upper Cretaceous). limestone. marine, flyschlike sequence. APPROXIMATE MEAN DECLINATION, 1951

Chara

Jpm

Base map from U.S. Geological Survey, 1:250,000 Talkeetna Mountains Quadrangle, Alaska, 1955 SCALE 1:250 000 CONTOUR INTERVAL 200 FEET DATUM IS MEAN SEA LEVEL HISTOGRAM SHOWING DISTRIBUTION OF ARSENIC IN HEAVY MINERAL CONCENTRATES · MAP SYMBOL NUMBER OF SAMPLES I MT. McKINLEY PERCENT 95.9 1.5 2.2 EXPLANATORY STATEMENT Location Index

EXPLANATION OF GEOCHEMICAL MAP SYMBOLS

Location of heavy mineral concentrate

Location of both stream sediment and

heavy mineral concentrate sample

O - Heavy mineral concentrate sample with

possibly significant arsenic value.

Increase in symbol size indicates higher

analytical value as shown on histogram.

▲ - Location of stream sediment sample

sample

CONCENTRATION

in ppm

In the course of U.S.Geological Survey investigations of the Talkeetna Mountains quadrangle, 1118 stream sediment, 852 heavy mineral concentrate, and 501 rock samples were collected. All of these samples were analyzed for up to 30 elements by a six-step semi-quantitative spectrographic method(Grimes and Marranzino, 1968). Most of the stream sediment and rock samples were also analyzed for up to 4 elements by atomic absorption spectrophotometry, as described by Ward and others (1969). The present map shows the sample collection sites of 1117 stream sediment samples and 852 heavy mineral concentrates which were analyzed for arsenic by the spectrographic method. None of the stream sediment analyses showed arsenic concentrations above the lower limit of analytical determination. Complete analytical data plus location maps, station coordinates, and discussion of sampling and analytical procedures for samples from sites shown on the present map are published in a report by Miller and others (1978). Concentration of metals in geochemical samples varies for different lithologies and in different areas. Because of this, as well as variability introduced from other sources such as sampling, practice, analytical variance, and degree of chemical weathering, it is impossible to select a specific analytical level above which values might indicate the presence of arsenic deposits. For this reason, the analytical values have been grouped into ranges (see histograms), each range being represented by a different symbol on the map. Higher values may indicate a greater likelihood of arsenic deposits, but confidence levels are low for "single-element" anomalies and for results

which are not supported by neighboring values.

MAP SHOWING GEOCHEMICAL DISTRIBUTION AND ABUNDANCE OF ARSENIC IN HEAVY MINERAL CONCENTRATES, TALKEETNA MOUNTAINS QUADRANGLE, ALASKA

R. J. Miller, G. C. Curtin, and Béla Csejtey, Jr.

1978

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.